



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Adams COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/050,169	01/18/2002	Shinichiro Ikemasa	970607B	9818
23850	7590	11/19/2003	EXAMINER	
ARMSTRONG, KRATZ, QUINTOS, HANSON & BROOKS, LLP			WEISS, HOWARD	
1725 K STREET, NW			ART UNIT	PAPER NUMBER
SUITE 1000			2814	
WASHINGTON, DC 20006				

DATE MAILED: 11/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

2000

Office Action Summary	Applicati n No.	Applicant(s)	
	10/050,169	IKEMASU ET AL.	
	Examiner	Art Unit	
	Howard Weiss	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-108 ~~is/are~~ are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-108 ~~is/are~~ are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached Detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: |

Attorney's Docket Number: 970607B

Filing Date: 1/18/02

Continuing Data: Division of 08/876,908 (6/16/97 now U.S. Patent No. 6,344,692)

Claimed Foreign Priority Date: 7/18/96 (JPX)

Applicant(s): Ikemasu et al. (Okawa)

Examiner: Howard Weiss

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 to 3, 8 to 10, 12, 13, 17, 24 to 26, 31 to 33, 38 to 40, 50 to 52, 56 to 60, 64, 65 and 72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Auer et al. (U.S. Patent No. 5,623,164) and Doan (U.S. Patent No. 5,204,286).

Auer et al. show most aspects of the instant invention (e.g. Figure 1) including:

- a substrate **1**
- a switching or memory cell transistor with an insulated gate **6** and source/drain regions **3,4**
- an insulator laminate including a lower part **15** covering said switching transistor and a higher part **50** having a planarized upper surface over the memory cell transistor
- a first conductive plug **9** formed in a first contact hole and connected to a source/drain region **3**
- a memory cell capacitor with a storage electrode **11**, a capacitor dielectric **47** and an opposing electrode **16** having an extension with is connected to a second conductive plug (not shown) via a second contact hole **18**

- a third conductive plug **8** formed above said lower part and connected to an upper surface of a lower conductive member **4**
- contact holes and conductive members (i.e. bit lines) as claimed in a peripheral circuit

Auer et al. do not show the contact hole penetrating through the extension of a opposing electrode, exposing its sidewall of said opposing electrode and electrically connected to said plug (i.e. conductor). Doan teaches (e.g. Figures 5 to 7) to form a contact hole **40** to penetrate an extension **28** exposing its sidewalls and establishing an electrical connection to provide a desired read, write or refresh data operation for the DRAM (Column 1 Lines 18 to 44). It would have been obvious to a person of ordinary skill in the art at the time of invention to form a contact hole to penetrate an extension exposing its sidewalls and establishing an electrical connection as taught by Doan in the device of Auer et al. to provide a desired read, write or refresh data operation for the DRAM.

3. Claims 4 to 7, 11, 14 to 16, 18 to 23, 27 to 30, 34 to 37, 41 to 49, 53 to 55, 61 to 63, 66 to 71 and 73 to 108 are rejected under 35 U.S.C. 103(a) as being unpatentable over Auer et al. and Doan, as applied to Claims 1, 2, 3, 38, 50 and 58 above, and in further view of Ozaki et al. (U.S. Patent No. 5,414,655).

Auer et al. and Doan show most aspects of the instant invention (Paragraph 2) except for the cylinder shape of the storage electrode and for the nitride film covering the claimed features in the memory device. Ozaki et al. teach (e.g. Figures 1 to 22) to make storage electrodes **25** cylindrical in shape and to cover features in a DARM with silicon nitride layers **13,22** to permit easy connection to the substrate while maintaining a large storage capacity (Column 1 Line 66 to Column 2 Line 2). It would have been obvious to a person of ordinary skill in the art at the time of invention to make storage electrodes cylindrical in shape and to cover features in a DARM with silicon nitride layers as taught by Ozaki et al. in the device of Auer et al.

and Doan to permit easy connection to the substrate while maintaining a large storage capacity.

Response to Arguments

4. Applicant's arguments with respect to claims 1 to 108 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Flagello et al. (U.S. Patent No. 4,840,923) show penetrating contact hole for interconnections.
6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

7. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. Papers should be faxed to Art Unit 2814 via the Art Unit 2814 Fax Center located in Crystal Plaza 4, room 3C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November

1989). The Art Unit 2814 Fax Center number is **(703) 308-7722** or **-7724**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications. The official TC2800 Before-Final, **(703) 872-9318**, and After-Final, **(703) 872-9319**, Fax numbers will provide the fax sender with an auto-reply fax verifying receipt of their fax by the USPTO.

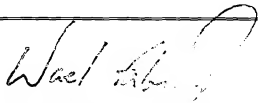
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Howard Weiss at **(703) 308-4840** and between the hours of 8:00 AM to 4:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via **Howard.Weiss@uspto.gov**.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group 2800 Receptionist at **(703) 308-0956**.

9. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 257/ 306, 311, 535	thru 11/4/03
Other Documentation: none	
Electronic Database(s): EAST	thru 11/4/03

HW/hw
4 November 2003


SUPERVISORY PRIMARY
TECHNOLOGY CENTER

Howard Weiss
Examiner
Art Unit 2814